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INTRODUCTION

In accordance with the City Auditor's 1991-92 Audit Workplan, we have reviewed the Department of Public Works' (DPW) capital projects management of unit-price and time and material (T&M) contracts. We conducted this audit in accordance with generally accepted government auditing standards and limited our work to those areas specified in the Scope and Methodology section of this report.

BACKGROUND

The Department Of Public Works

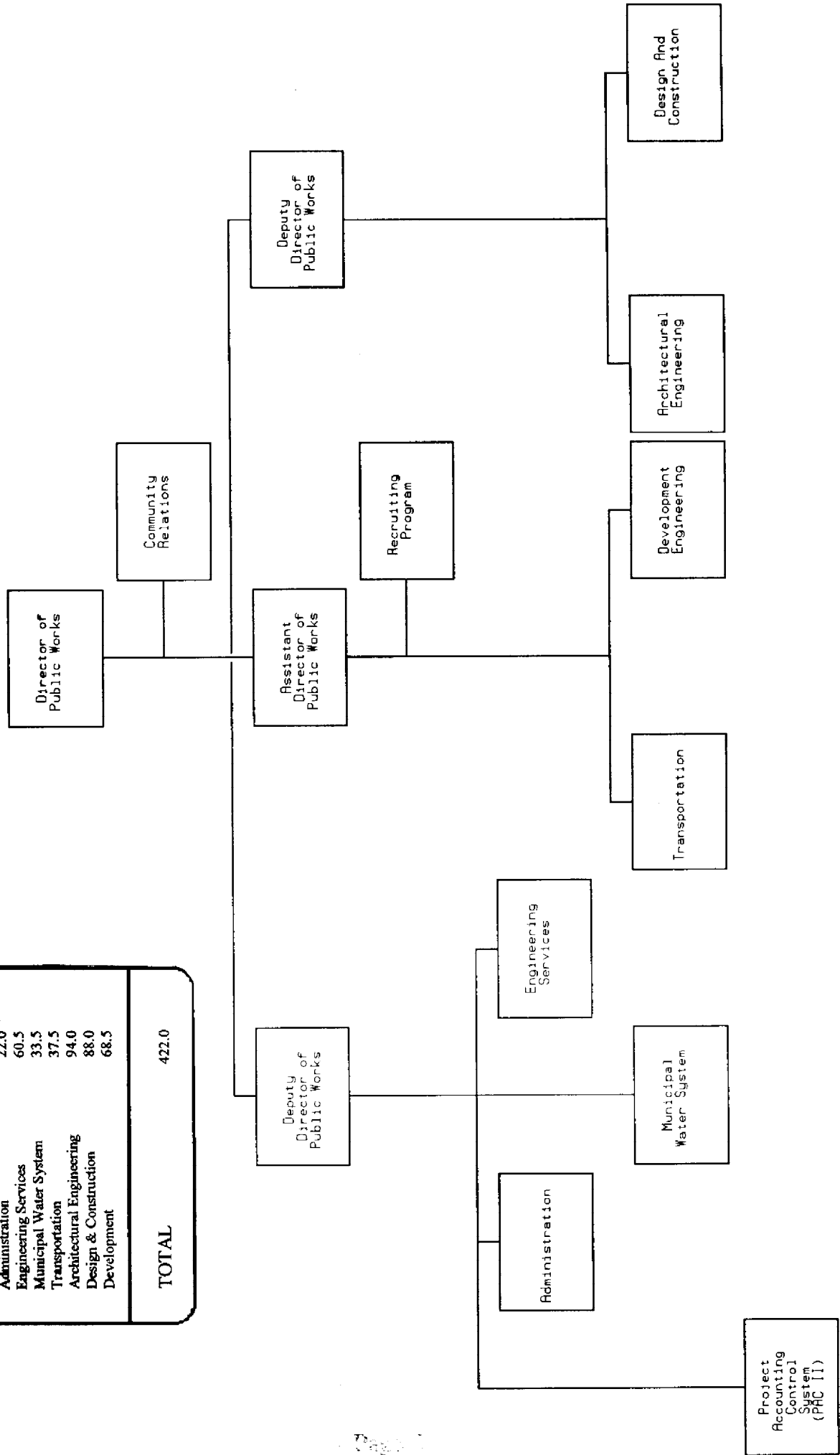
The mission of the DPW is to program, plan, design, and construct a variety of public facilities; review private developer-funded public improvements; and operate the San Jose Municipal Water System.

Chart I shows the organization chart of the DPW.

CHART I

**ORGANIZATION CHART FOR THE
DEPARTMENT OF PUBLIC WORKS**

BUDGET UNIT	BUDGETED POSITIONS
Management	15.0
PAC II	3.0
Administration	22.0
Engineering Services	60.5
Municipal Water System	33.5
Transportation	37.5
Architectural Engineering	94.0
Design & Construction	88.0
Development	68.5
TOTAL	422.0



The DPW is the City department that is most responsible for the City's capital projects. The City's Capital Budget divides capital projects into three sections: (1) Construction Projects, (2) Non-Construction Projects, and (3) Transfers. The construction projects for which the DPW is responsible include land acquisition, master plans, design, engineering, and all inspections associated with a project. In addition to managing capital projects in its own Sanitary Sewer, Storm Drain, and Municipal Water System Divisions, the DPW manages projects for other departments such as Streets and Traffic, Recreation, Parks and Community Services, the Library, and the Airport. In the *Adopted 1990-91 Capital Budget*, total expenditures for capital construction projects were budgeted at approximately \$163 million. The DPW enters into various types of contracts to carry out the construction of capital projects.

According to the City's *Organizations and Functions Manual 1991-92*, DPW divisions have the following duties relevant to contract management:

1. The Administration Division provides contract administration, processes contract awards, and performs accounts payable functions;
2. The Engineering Services Division provides quality assurance and quality control, oversees construction management, ensures common inspection standards, and performs construction audits;
3. The Municipal Water System Division plans, designs, and constructs Municipal Water System facilities and provides construction administration and construction inspection services;
4. The Architectural Engineering Division plans, designs, and constructs City building, airport, and park facilities, and landscapes streets. Each section within this division provides project management and inspection during construction;

5. The Design and Construction Division designs and constructs capital improvement projects, accepts bids, awards construction contracts, inspects construction on capital projects for conformance to plans and specifications, and verifies and justifies payment for work completed by contractors. Each section within this division monitors construction contracts for quantity control and payment; and
6. The Development Engineering Division provides engineering review, inspection, and approval of private developer-funded public improvements.

Major Accomplishments Relating To The Administration Of T&M Contracts

In Appendix C, the DPW informs us of its major accomplishments in administering unit-price and T&M contracts. According to the Director of Public Works, the Municipal Water System Division has:

- Reassigned staff members to ensure more complete inspection of installations;
- Developed two new inspection forms and instructed staff on their use; and
- Improved inspection documentation by using a portable dictation device.

In addition, the DPW has been preparing an emergency contract procedure for T&M contracts and has initiated a series of construction management seminars for construction inspectors.

SCOPE AND METHODOLOGY

This is our first report on the DPW's Capital Projects Management. Our objectives were to determine the following:

- The adequacy of City controls in place to verify the correctness of payments to contractors for unit-price and T&M contracts; and
- Whether the Office of Affirmative Action and Contract Compliance, which reports to the City Manager's Office, was adequately monitoring the payment of prevailing wages for the T&M contracts reviewed.

We reviewed the payment practices in effect for seven of thirty-six unit-price contracts that the City awarded in the 1990-91 fiscal year to assess the adequacy of internal controls over quantities reported as installed. We reviewed payments and the supporting documentation for these payments on unit-price contracts in the following DPW divisions:

- The Architectural Engineering Division (Airport Section);
- The Design and Construction Division (Sanitary Sewer Section);
- The Development Engineering Division (Assessment Bonds Section); and
- The Municipal Water System Division.

Further, we reviewed three of six T&M contracts that the Municipal Water System, Architectural Engineering, and Design and Construction Divisions awarded in 1990-91. We also reviewed two 1989-90 T&M contracts on which the City made substantial payments in 1990-91.

In conducting our audit, we obtained from the DPW an understanding of their system of internal controls and how those controls work to prevent unwanted events from occurring. We also developed an audit program to examine and evaluate the DPW's internal control system by (1) observing operations, (2) interviewing personnel, (3) inspecting relevant data, (4) analyzing reports, and (5) testing controls.

We limited our review to City records. We did not review the contractors' records, nor did we physically observe work on the unit-price contracts.

FINDING I

THE DEPARTMENT OF PUBLIC WORKS NEEDS TO DEVELOP ADDITIONAL POLICIES, PROCEDURES, FORMS, AND DOCUMENTATION TO ENSURE THE CORRECTNESS OF PAYMENTS TO CONTRACTORS FOR TIME AND MATERIAL AND UNIT-PRICE CONTRACTS

The Department of Public Works (DPW) is primarily responsible for managing the City of San Jose's capital projects. In 1990-91 the City awarded 106 construction contracts for approximately \$51 million. Of these contracts, \$37,800,000 were unit-price contracts and \$538,000 were time and materials (T&M) contracts; the remaining were lump-sum contracts. Our review of the DPW's management of unit-price and T&M contracts revealed that:

- The DPW needs additional written policies and procedures regarding what its inspectors are expected to do or what responsibilities inspectors, project managers, and division chiefs are assuming when they sign-off on different documents;
- The DPW lacked adequate procedures regarding how inspectors should conduct inspections, prepare inspection reports, or authorize payments to contractors;
- The DPW lacked standardized forms for inspection reports;
- The DPW approved some payments to contractors without adequate supporting documentation;
- Inadequate separation of duties existed in that DPW employees who verified contractor work also approved contractor billings; and
- The Office of Affirmative Action and Contract Compliance's role in monitoring prevailing wage requirements is organizationally inefficient.

As a result, the DPW relies on contractors to submit accurate billings which, in turn, exposes the City to the risk of paying for work not actually performed. By developing additional written policies, procedures, and forms and by requiring additional documentation and separation of duties over the contractor payment process, the DPW can have added assurance that payments to contractors for unit-price contracts and T&M contracts are correct.

Unit-Price Contracts And T&M Contracts

Our audit focused on two types of contracts that the DPW enters into: namely, the unit-price contract and the T&M contract.¹ A unit-price contract is a contract on which the DPW makes payments according to a bid price per unit of measurement for materials or services. For example, under a unit-price contract, the DPW might pay a contractor a dollar per linear foot to install 100 linear feet of sewer pipe. For a T&M contract, a contractor bills the DPW for labor, or "time," at an agreed upon hourly rate. Such an hourly rate normally includes charges for overhead and profit. Contractors bill the DPW for materials at cost plus a percentage for overhead and profit and bill for equipment at an hourly rate similar to labor. An example of a T&M contract is emergency pavement repairs.

In 1990-91, the City awarded 36 unit-price contracts for approximately \$38 million. Various DPW divisions managed these contracts. Table I summarizes the unit-price contracts awarded in 1990-91.

¹ Other types of contracts that the DPW enters into are the consultant agreement and the lump-sum contract. In 1990-91, the DPW awarded 76 consultant agreements, totaling approximately \$16 million, and 64 lump-sum contracts, totaling approximately \$12.5 million.

TABLE I

SUMMARY OF UNIT-PRICE CONTRACTS AWARDED IN 1990-91

<u>Division</u>	<u>Number of Contracts</u>	<u>Amount</u>	<u>Percent</u>
Design and Construction	29	\$ 28,500,000	75%
Development Engineering	5	8,400,000	22%
Architectural Engineering	1	430,500	1%
Municipal Water System	<u>1</u>	<u>469,500</u>	<u>2%</u>
Total	<u>36</u>	<u>\$37,800,000</u>	<u>100%</u>

In 1990-91, the City awarded six T&M contracts, totaling approximately \$538,000. The Design and Construction, Municipal Water System, and Architectural Engineering Divisions in the DPW managed two T&M contracts each.

**The DPW And Other Organizations' Administration
Of Unit-Price And T&M Contracts**

To assess the DPW's system of controls over unit-price and T&M contracts, we compared the DPW's controls to several other organizations that use unit-price and T&M contracts.

Table II compares DPW division controls over unit-price and T&M contracts with those of the other organizations we contacted.

TABLE II

**COMPARISON TO OTHER ORGANIZATIONS
OF THE DEPARTMENT OF PUBLIC WORKS' CONTROLS
TO MONITOR UNIT-PRICE AND T&M CONTRACT PAYMENTS**

	DPW - DESIGN AND CONSTRUCTION DIVISION	DPW - ARCHITECTURAL ENGINEERING DIVISION	DPW - MUNICIPAL WATER SYSTEM DIVISION	DPW - DEVELOPMENT ENGINEERING DIVISION	SANTA CLARA COUNTY TRANSPORTATION AGENCY (SCTA)	CITY OF LOS ANGELES	CITY OF SACRAMENTO	CITY OF SANTA CLARA	DAY AREA DPW TRANSIT DISTRICT (DCTD)	PACIFIC TELEPHONE	PACIFIC GAS AND ELECTRIC (PG&E)	SOUTHERN CALIFORNIA GAS (SCG)
WRITTEN POLICIES AND PROCEDURES					xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
FIELD INSPECTORS					xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
MANUAL					xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
STANDARDIZED DOCUMENTATION	xxx 1	xxx 1	xxx 1	xxx 1	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
INSPECTORS USE REQUIREMENTS												
STANDARDIZED FORMS	xxx				xxx	xxx	xxx 2	xxx	xxx	xxx 3	xxx	xxx 4
STANDARDIZED CONTRACTS FOR UNIT-PRICE CONTRACTS												
INSPECTORS USE STANDARDIZED FORMS TO SUBSTANTIATE CHARGES FOR TIME AND MATERIAL	xxx		5		xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
STANDARDIZED MEASUREMENT OF QUANTITIES AND EVIDENCE OF SUCH BECOME BASIS FOR CONTRACTOR PAYMENT	xxx				xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
CONTRACTOR PREPARED FOR UNIT-PRICE CONTRACTS BASED ON INSPECTORS' MEASUREMENTS	xxx				xxx	xxx 6	xxx	xxx	xxx	xxx	xxx	xxx
REVIEWING CONTRACTOR PAYMENTS AND MONITORING PREVAILING REQUIREMENTS					xxx	xxx	xxx	xxx	xxx	7	7	7
SEPARATION OF DUTIES IN THE PAYMENT PROCESS	xxx				xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
SEPARATE CONSTRUCTION DIVISION/SECTION												

(1) Standard Specifications indicate what is to be measured. Divisions are inconsistent on how to measure and how to document to ensure compliance with Specifications.

(2) Inspectors submit monthly summaries of measurements to Sacramento's DPW administration for payment; however, measurements are on non-standardized forms.

(3) Yes, for most standardized measurements.

(4) Standardized forms are in use for major construction projects.

(5) During the audit, this division developed new inspection forms and improved inspection documentation for installation work.

(6) Blank form to record measurements for the progress payment is computer-generated and sent to the inspector.

(7) Prevailing wage requirements are not applicable for these organizations.

As shown in Table II, other organizations have various controls to monitor payments on unit-price and T&M contracts that the DPW does not. A basic control that is currently missing in the DPW is the documentation of policies and procedures for monitoring contract payments. Other controls that the DPW can implement to improve its monitoring function include the development and use of a field inspectors' manual and standardized forms to document payments to contractors. The remainder of this report will address these and other controls in Table II.

The DPW Needs Additional Policies And Procedures Regarding What Its Inspectors Are Expected To Do Or What Responsibilities Inspectors, Project Managers, And Division Chiefs Are Assuming When They Sign-Off On Different Documents

The DPW lacks explicit policies and procedures to guide the project inspectors, project managers, and division chiefs as to their authority, responsibility, and accountability for contract payments. It is therefore unclear what DPW inspectors are expected to do or what responsibilities inspectors, project managers, and division chiefs are assuming when they sign-off on various documents.

The lack of department-wide written policies and procedures has resulted in inconsistent contract monitoring and payment documentation practices among DPW divisions. Consequently, the DPW has not been consistent in documenting and monitoring payments to contractors for unit-price and T&M contracts. The following observations demonstrate this lack of consistency between the different divisions:

1. The understanding of assertions made when inspectors, project managers, and division chiefs signed payletters varied. For example, while the Design and Construction Division required the City inspectors and the contractor's representative to agree upon and sign the daily work report, the Architectural Engineering Division did not require approval. Another example is the reviewing of labor rates. While the inspectors at the Architectural Engineering Division reviewed contractors' labor rates, those at the Design and Construction and the Municipal Water System Divisions did not.
2. Inspectors were not consistent in documenting their work. As a result, inspection reports were not completed for payments on T&M contracts in the amount of approximately \$159,000. Additionally, inspectors in the Design and Construction Division signed the daily work reports, while inspectors in the Airport Section of the Architectural Engineering Division and the Municipal Water System Division did not.
3. Approval of payments with no inspection reports meant an over-reliance on inspectors' memories of actual labor hours incurred, equipment rental hours used, and materials used long after the work had been completed. In one contract at the Municipal Water System Division, the average difference was 25 days between the dates the inspector and project manager approved payments and the dates the contractor had actually performed the work. In two contract payments, the time difference exceeded 40 days.
4. Documentation practices differed among the DPW divisions. In the Airport Section of the Architectural Engineering Division, the Assessment Bonds Section of the Development Engineering Division, and the Municipal Water System Division the primary evidence for approving payments for unit-price contracts was the contractors' billings. In the Design and Construction Division, however, the primary evidence for approving payments was the summary of the actual measurements the inspectors prepared.

5. Approval levels varied among the divisions. For example, only the division chief at the Design and Construction Division approved contract payletters, while the division chief, project manager, and the inspector at the Airport Section of the Architectural Engineering Division approved the same type of document.
6. The scope of the inspectors' verification was inconsistent for T&M contracts. For example, in the Design and Construction and the Municipal Water System Divisions, inspectors verified labor and equipment usage hours, while in the Airport Section of the Architectural Engineering Division, the inspectors verified usage hours and the reasonableness of labor and equipment rates.

Other organizations have recognized the importance of written policies to guide their staff in monitoring payments on unit-price and T&M contracts. For example, the Santa Clara County Transportation Agency (SCCTA) has developed a Field Inspection Manual and a Construction Administration Manual. The SCCTA's Field Inspection Manual assists field inspectors and field office engineers in clarifying the use of the forms and procedures used in construction operations, while the Construction Administration Manual provides guidance to the SCCTA staff in the administration of contracts. The SCCTA's Construction Administration Manual includes the following sections:

- ✓ Organization
- ✓ Authority and Responsibility
- ✓ Accidents
- ✓ Vehicles
- ✓ Employee Working Conditions
- ✓ Community Relations and Complaint Resolution
- ✓ Fair Employment Procedures
- ✓ Communication
- ✓ Submittals
- ✓ Changes To Contract
- ✓ Progress Payments
- ✓ Quality Assurance

- ✓ Claims
- ✓ Reports
- ✓ Meetings
- ✓ Acceptance and Final Closeout
- ✓ Safety
- ✓ Cost Management;
- ✓ Scheduling
- ✓ Instructions for the Resident Inspector
- ✓ Minor Construction and Maintenance Projects

In contrast, the DPW has not developed adequate written policies and procedures for its staff. In our opinion, the DPW can benefit greatly by implementing written policies and procedures. Policies are general statements that guide thinking and action in decision-making. In addition, policies indicate a preferred method for achieving objectives. Procedures detail the exact manner in which the department's staff accomplishes its responsibilities. Procedures consist of a set of specific steps in chronological order and serve as a guide to action. The advantages of having policies and procedures are that they (1) reduce the need for managerial direction of routine matters, (2) improve efficiency through standardization of actions, (3) facilitate the training of personnel, and (4) provide coordination among different divisions. To be useful, policies and procedures must be in writing so that they are clearly delineated and yet flexible enough to be adaptable to new situations. By keeping them in manuals, the DPW can also make policies and procedures easily accessible to its staff. Difficulties in the administration of policies and procedures arise when they are improperly formulated, misunderstood, inflexible, miscommunicated, outdated, or unaccepted. In *A Study of Project Management for the Redevelopment Agency of the City of San Jose* (February 1991), David E. Baker & Associates stated, "*The lack of relevant procedures almost assures that people will misunderstand and miscommunicate.*"

By implementing written policies and procedures, the DPW can improve the efficiency and effectiveness of its operations. Written policies and procedures can help ensure that DPW staff apply the controls over unit-price and T&M contracts consistently and accurately. In addition, they help management demonstrate its effectiveness and accountability. Therefore, in our opinion, the DPW should develop written policies and procedures to guide the project inspectors, project managers, and division chiefs as to their authority, responsibility, and accountability in monitoring payments to contractors for unit-price and T&M contracts.

The DPW Lacked Adequate Procedures Regarding How Inspectors Should Conduct Inspections, Prepare Inspection Reports, Or Authorize Payments To Contractors

Our audit disclosed that the DPW lacked procedures regarding how inspectors should conduct inspections, prepare inspection reports, or authorize payments to contractors. Specifically, the DPW divisions did not have a field inspectors' manual delineating the duties of the inspectors. Although the Design and Construction Division has prepared Construction Inspection Guidelines and distributed them to the other divisions, these guidelines do not provide specific procedures for conducting inspections, preparing inspection reports, or determining payments to contractors.

Because DPW divisions did not have uniform procedures to monitor payments to contractors for unit-price and T&M contracts, we reviewed the payment practices at the Architectural Engineering and the Development Engineering Divisions. Our purpose was to determine the understanding of assertions made when inspectors, project managers, and division chiefs sign payletters.

In the Architectural Engineering and the Development Engineering Divisions, the inspectors review, revise, or recommend revisions to billings that contractors submit for payment. Other division personnel, such as a senior civil engineer, make manual adjustments to the contractors' billings. The DPW does not have written procedures specifying the type of documentation required to support payments to contractors. As a result, the project files in the Architectural Engineering and the Development Engineering Divisions do not consistently include inspectors' documentation for authorizing payments. The contractor-prepared billings are the primary documents in the file that the project manager or division chief uses to approve payments.

In our opinion, the City is exposed to the following risks when the DPW uses contractors' billings rather than the inspectors' supporting documentation as the primary evidence authorizing payments:

- DPW personnel may not detect irregularities or unintentional errors on the contractor-prepared billings;
- Evidence of inspectors' accountability is not demonstrated at the field level. Thus, the City may be paying for work that the contractors did not perform or that may not be in accordance with contract specifications; and

- Project managers and division chiefs may be approving payletters without evidence that inspectors performed an independent measurement or verification of the quantities installed.

Despite these risks, some DPW divisions relied primarily on contractors to prepare the documentation for project payments. Our audit disclosed that using contractor-prepared billings as the primary evidence for payment resulted in errors or omissions, such as the following:

- In at least one contract, division staff did not detect irregularities or unintentional errors on the contractor's billings. In the contract for the Airport Boulevard Widening project, contractor billings that the construction inspector, the project manager, and the division chief approved contained an extension error that resulted in an apparent overcharge of \$241,500. Our subsequent review revealed that this item was, in fact, the contractor's error, which did not result in an overpayment. However, the fact that the same error escaped the attention of the payment approvers on two consecutive payments underscores the need for using inspectors' certification of measurements as the primary basis for payments.

The Airport Boulevard Widening project consisted of 58 bid items with a contract award of \$1,782,455. The contractor apparently had overcharged the City \$241,500 on billings as of March 5, 1991, and June 5, 1991, for Class III Aggregate Base. The contractor's billings for this item indicated 899.98 tons of material installed to date at a unit-price of \$11.50 per ton. The extension total for this installation should have been \$10,349.77 (899.98 x \$11.50). However, the extension total on the contractor's billing for these two payletters was \$251,849, implying that the contractor had installed 21,000 tons more than the billing showed. We noted that while DPW staff had made manual adjustments to other bid items on these and other payletters, they apparently did not detect this extension error. Because the inspectors did not submit documentation for the contractor's billings to the division level, we reviewed the documentation at the inspector's location. Our review indicated that the contractor had erroneously reported the quantity billed at 899.98 tons instead of the 21,899.98 tons that the contractor had installed. Thus, the billed amount, although apparently incorrect, was in fact correct. We reviewed this

documentation nine months after the City had made the payment to the contractor. Even though the DPW did not overpay the contractor in this case, the contractor's billing documentation still did not support the payment the DPW made nine months before.

- In another contract, the inspection reports did not support \$212,000 of \$1,020,000 in contract payments. Thus, the City may have paid for work that the contractor did not perform. Specifically, the contractor's billings totaling \$1,020,000 for installed pipes for the Silver Creek Valley Water System Improvements Contract did not agree with quantities shown on the inspectors' reports. The inspectors' reports supported payments for only \$808,000 in installed pipes.

The Silver Creek Valley Water System Improvements Contract consisted of 29 bid items with a contract award of \$3,172,640. We selected six unit-price bid items from the Schedule of Quantities. The total of the six items we selected for review was \$1,118,470 including one item with an estimated quantity of 12,950 linear feet of pipe at \$80 per linear foot, for a total of \$1,036,000. We requested the inspector's supporting documentation that authorized payment for the 12,750 linear feet actually installed. When we reviewed the inspector's reports for quantities installed, they did not support the quantities for which the City had paid. The inspection reports verified 10,100 linear feet installed. Thus, the inspection reports supported only payments in the amount of \$808,000. The inspection reports did not support payments in the amount of approximately \$212,000 (21%).

On April 27, 1992, after discussing this matter with the City Auditor's office, the DPW prepared additional supplemental information to support the questioned \$212,000 in payments on the Silver Creek Valley Water System Improvements Contract. While this supplemental information seems to justify the \$212,000 payment, it is still significant that the DPW had to prepare this information six months after paying the contractor.

These two examples indicate that certain DPW divisions were approving payments to contractors without the primary evidence for payment being inspectors' supporting documentation. Our audit disclosed the following additional circumstances that support our observation that the project managers, senior civil engineers, and division chiefs at the Architectural Engineering, Municipal Water System, and Development Engineering Divisions were approving contract payments without adequate supporting documentation:

- The inspectors did not report their measurements of the actual quantities installed on the daily inspection reports. The manner in which some of the inspectors completed their inspection reports (i.e., certification that actual quantities installed had been measured) was not self-evident on some of these reports and required additional interpretation and explanation to determine the amount of the payment;
- Throughout the job, inspectors filed their records at the project site, and they did not prepare summaries of measurements of actual quantities installed based on those records. Thus, the division office had on file neither a copy of the inspection reports nor summaries of measurements; and
- The inspectors' documentation was not always readily available for our review. It took division personnel a great deal of time to gather primary evidence to support certain payments that were made approximately a year before. In addition, even after extensive searches, the evidence division personnel produced still required additional interpretation and/or explanation to support the payments made to contractors.

Unlike the three DPW divisions discussed above, the DPW's Design and Construction Division does have practices in place that do provide adequate assurance that contract payments are accurate and demonstrate good documentation control techniques. These Design and Construction Division practices are:

- The inspectors demonstrate their accountability in the field by recording measurements of quantities installed;
- The inspectors submit written support for actual measurement of the work performed in accordance with contract specifications;
- The project managers use the inspectors' measurements, rather than the contractors' billings, as the basis for approving payments; and
- The division files the inspectors' measurements in the project files.

In our opinion, the Design and Construction Division has in place good documentation controls that the other DPW divisions should emulate. Accordingly, the DPW should develop and implement department-wide written procedures reflecting the practices the Design and Construction Division follows. Further, the DPW should require that all divisions document contract payments with the inspectors' certification of the measurement of actual quantities installed rather than with the contractors' billings.

The DPW Lacked Standardized Forms For Inspection Reports

The DPW could further improve its practices by developing standardized forms to assist the inspectors in summarizing the actual measurements they record. Standardized forms have been a long-established technique to facilitate uniformity and control. A pronouncement of the American Institute of Certified Public Accountants, *Consideration of the Internal Control Structure in a Financial Statement Audit*, identifies control procedures as an element of the internal control structure. One important category of control procedures is ". . . the design and use of adequate documents and records to help ensure the proper recording of transactions and events."

Further, our survey of Bay Area Rapid Transit District (BART), Pacific Telesis, Pacific Gas & Electric, Southern California Edison, the cities of Los Angeles, Sacramento, and Santa Clara, and the SCCTA revealed that their inspectors are required to use standardized forms.

We interviewed personnel in the Construction Operations Section at SCCTA. Inspectors for this agency prepare daily diaries and weekly reports. In addition, the inspectors record on standardized forms current and to-date quantities installed. The quantities the inspectors record on the standardized forms must agree with the inspector's daily diary. The contractor or the contractor's representative must sign the form to document his or her agreement. The division accountant uses the quantities reported on the standardized forms to prepare the payment. The SCCTA has found these standardized forms to be beneficial and effective.

The DPW can also benefit from standardized forms similar to those that the SCCTA uses. In fact, the DPW's Design and Construction Division was using comparable documents when authorizing payments. However, this division could still improve its practices by developing more standardized forms to assist the inspectors in preparing the documents. For example, the Design and Construction Division can benefit by implementing standardized forms to assist the inspectors in summarizing the actual measurements on the Schedule of Quantities form. The Schedule of Quantities (see Appendix D) is a part of each unit-price contract and specifies the estimated quantities for each bid item. As the project progresses, the inspectors measure actual quantities installed and summarize their measurements on the Schedule of Quantities. Inspectors submit these schedules to the division secretary, who prepares the payletters. The division chief then reviews and approves these payletters, together with the supporting documents.

When we reviewed the Design and Construction Division's payletters and supporting documents, we were able to find the inspector's monthly summary of measurements recorded on the Schedule of Quantities for these projects in the division project files. We were also able to trace the summarized quantities to the inspectors' daily reports. Accordingly, we were satisfied that this division's practices, although not formalized, provided an adequate trail to support payments. However, we also noted that some inspectors recorded their measurements on pieces of scratch paper. Using standardized forms will improve the division's documentation of measurements. With standardized forms, the division can better organize and document measurement information and be assured of its completeness before making payments.

The three other DPW divisions that we reviewed (Architectural Engineering, Municipal Water System, and Development Engineering) were not using the Schedule of Quantities as a summary sheet at all. Furthermore, the documentation these three divisions used to support payletters consisted of such informal documents as scratch paper and adding machine tapes. As such, the inspection and approval process for these divisions appears to be incomplete. In our opinion, using standardized forms can help the inspectors and office personnel in these divisions to ascertain that the inspections are sufficient and adequately documented before making payments to contractors.

With regard to T&M contracts, the DPW could also improve its documentation by using standardized forms. For example, a form that the DPW can standardize is the Daily Extra Work Record form. The SCCTA uses such a form (Appendix E) to document or summarize laborer name and classification, labor hours and hourly rate, equipment used, and materials used. Both the County's inspector and the contractor's representative sign the form. By using this form, the County ascertains that its inspectors perform their work properly and obtains documented concurrence from the contractor's authorized representative regarding time spent and materials used.

In the DPW, at least one division has started to use standardized forms. Realizing the importance and usefulness of standardized forms, an inspector at the Municipal Water System Division has designed his own forms to monitor T&M contracts. Appendix F shows examples of the forms that the inspector designed. These forms are comparable to those that the SCCTA uses. In our opinion, the DPW could use these forms to design standardized forms for all DPW divisions.

The use of standardized forms can improve the DPW's documentation of payments for unit-price and T&M contracts. In addition, standardized forms will facilitate uniformity and control over documentation within the DPW. Therefore, in our opinion, the DPW should develop standardized forms for recording actual inspector measurements and a Schedule of Quantities form for summarizing individual inspector measurements. Such standardized forms will help ensure that DPW inspectors provide adequate and sufficient information and will facilitate supervisory reviews of DPW inspection work.

The DPW Approved Some Payments To Contractors Without Adequate Supporting Documentation

Sydney M. Levy, in his book *Project Management in Construction*, states, *"Proper or adequate documentation of a construction project involves maintaining sufficient records to account for the actions and inactions of all participants to the process."* He lists the following benefits of proper and adequate documentation:

- It creates a history of the project to which the agency can refer when it encounters similar jobs with similar problems;
- It provides enough information so that, if the agency reassigns the project, a new project manager can trace the job history to date and continue the administration of the project easily;
- It provides more than just the reliance on one's memory to reconstruct various segments of a project's activity long after it has been completed;
- It reduces the possibility of future misunderstandings, disagreements, or disputes by committing important events or verbal communications to written ones; and
- It will be available in the event of litigation. The construction industry is such that exposure to the risk of lawsuits is very high. An inspector's daily diary is the only legal document that describes the entire scenario of the

construction activity. If litigation is being considered, proper documentation, such as the inspector's daily diary, will be invaluable.

To ensure that the City realizes the benefits of proper and adequate documentation, the DPW needs to set specific guidelines for standardizing documentation when the divisions prepare payments. Our review of the DPW contract files indicated that lack of such specific guidelines has resulted in missing or insufficient documentation. Specifically, we found the following deficiencies in the DPW contract files we reviewed:

1. Required documentation was missing in some files. For example, on the T&M 1990 Minor Pavement Repair I project, the Architectural Engineering Division's independent inspector records did not provide all the required information for a work order involving pavement repair at the San Jose International Airport.
2. Certain documents were apparently misfiled. For example, according to the project manager on the same T&M 1990 Minor Pavement Repair I project, the division misfiled two daily work reports.
3. Documents did not provide a trail to support charges for work performed. For example, in the T&M installation work totaling approximately \$104,000 that R. W. French Construction, Inc. performed for the Municipal Water System Division from September 1990 to April 1991, the division did not prepare inspection reports. Furthermore, inspectors were authorizing payments for this work without inspection reports and long after the work was completed. The difference between the date of the inspector's signature on the payletters and the date T&M work had been completed averaged 25 days. Thus, inspectors were relying on memory rather than documentation to verify actual work performed.

4. Inspection reports were incomplete for a project involving T&M emergency repairs to the Municipal Water System. The contractor billed \$85,023 to the Municipal Water System Division for six repair incidents in March 1991. The division completed City inspection reports on 5 of the 6 incidents. However, the one incident for which the division did not prepare an inspection report accounted for approximately \$55,000 (65%) of the total amount.
5. Even when inspectors completed inspection reports, the reports did not fully support the amounts that the contractor billed. For example, in the unit-price Silver Creek Valley Water System Improvements Contract, the inspection reports supported payments in the amount of approximately \$808,000 for pipe installed. Additional payments in the amount of approximately \$212,000 were not supported by these inspection reports.
6. Finally, our recently completed audit of the DPW's cost estimating process indicated that required documentation was missing for 6 of 15 projects we reviewed.

To ensure proper and adequate contract monitoring and recordkeeping, the DPW should establish specific guidelines that inspectors, project managers, and division chiefs are to use when they authorize and approve payments. These guidelines should address the type and format of documentation for each type of contract to ensure adherence to contract specifications. Furthermore, these guidelines should require that the inspectors' documentation of the contractors' work does not require additional explanation or interpretation to support payments.

**Inadequate Separation Of Duties Existed In That
DPW Employees Who Verified Contractor
Work Also Approved Contractor Billings**

A good system of internal controls requires an adequate separation of duties. Separation of duties is an important control to prevent undesirable events, such as fraud, from happening. Organizations should segregate the work among employees so that no one person performs incompatible functions or is not subject to another person's review or supervision.

Our review of the DPW operations indicated that inadequate separation of duties exists. Specifically, at the Architectural Engineering, Municipal Water System, and Development Engineering Divisions, we noted that inspectors both measured the amount of work completed and reviewed, as well as approved, the contractors' billings for the work. Therefore, inspectors controlled more than one key duty in the payment process.

In our opinion, the DPW should implement written policies and procedures for all its divisions to assign responsibilities such that the same person or persons do not inspect the work that contractors perform and review and approve contract payments. Specifically, if the inspectors are responsible for certifying work performed, they should not approve the contractors' billings for such work. Inspectors should be responsible for submitting completed inspection reports, while project managers and other division personnel should be responsible for using those reports when approving payments. Separation of duties helps to prevent potential fraudulent actions that can occur when the same individuals are completely authorized and responsible for work inspections and payment approvals.

**The Office of Affirmative Action And
Contract Compliance's Role In Monitoring
Prevailing Wage Requirements Is Organizationally Inefficient**

In February 1989, the City Council adopted Resolution 61144 requiring the payment of the general prevailing rate of per diem wages for designated City projects and services to the City. In accordance with this resolution, the City requires contractors of public works construction projects to submit weekly certified payrolls. The Office of Affirmative Action and Contract Compliance (OCC), which reports to the City Manager's Office, is responsible for monitoring the payment of prevailing wages on construction contracts. The City's Organization and Functions Manual 1991-92 states that one of the OCC's functions is to review contractors' certified payrolls weekly to ensure payment of prevailing wages. Although the DPW is charged with the responsibility of monitoring contract performance and approving payments to contractors, the Organization and Functions Manual 1991-92 is unclear as to how the DPW is to coordinate with the OCC in enforcing the prevailing wage requirements.

Our review of T&M contracts indicated that the City has not adequately monitored such contracts for compliance with the requirements of Resolution 61144. Specifically, our review disclosed the following deficiencies:

1. In 3 of 4 projects we reviewed, the contractors did not submit the required weekly certified payrolls. The three projects for which the contractors did not submit certified payrolls were the San Jose International Airport Minor Pavement Repair I, the San Jose International Airport Minor Pavement Repair II, and Miscellaneous Installations and Repairs to San Jose Municipal Water System Facilities. We notified the OCC personnel of this situation, and the office has initiated corrective action.

2. The OCC monitors prevailing wage rates on the certified payrolls but does not compare these rates to those on the daily work reports. On the other hand, the DPW monitors labor hours through the daily work reports but does not compare the rates on these reports to those on the certified payrolls. As a result, no one department is responsible or accountable for the entire prevailing wage process.

Furthermore, for capital projects, the OCC does not notify the DPW during project construction that the contractor has not submitted certified payrolls. The OCC notifies the contractor of non-submission of certified payrolls only during the final acceptance stage of capital projects when the DPW requests the OCC to confirm that they received the certified payrolls. As a result, the City's prevailing wage process, by definition, is reactive rather than proactive. Consequently, the City makes payments to contractors before the OCC verifies that the contractors have complied with prevailing wage requirements.

According to the OCC, lack of staff has resulted in inadequate monitoring of certified payrolls for compliance with prevailing wage requirements. However, a more basic reason for the inadequate monitoring may be that the wrong office is performing the monitoring function. In our opinion, the DPW can perform the monitoring more effectively and efficiently for the following reasons:

1. The DPW is familiar with the projects and their manpower requirements. The DPW can include compliance with the prevailing wage requirements as one of the items that it should verify;
2. The DPW approves payments. It can enforce the prevailing wage requirements directly by withholding the payments if the contractor does not comply with the requirements; and

3. The DPW maintains project records. The DPW can file certified payrolls with each project's records, thus making the filing of project verification records centralized and more efficient.

The OCC has a program goal to establish minority and women in business enterprise participation in City contracts. The City Council's and the City Manager's support for minority and women in business enterprise outreach is a stated priority.² The OCC, however, does not allocate sufficient time for minority and women in business enterprise outreach because of the time required to perform regulatory processes such as prevailing wage monitoring. If the City transfers the function for monitoring and enforcing prevailing wage requirements from the OCC to the DPW, then the OCC will be able to devote more staff time to the minority and women in business enterprise outreach.

Our survey of other organizations indicated that they have successfully consolidated prevailing wage monitoring with other contract monitoring functions in their public works departments. For example, the cities of Los Angeles and Sacramento and the SCCTA have included the monitoring of prevailing wage requirements in their public works functions. In addition, unlike the OCC, these organizations use a log as a control technique to ensure that all certified payrolls that should be submitted are received. So that the City can ascertain that City contractors comply with the City Council Resolution mandating the payment of the general prevailing rate of per diem wages for designated City projects and services to the City, the City should use a log to monitor and document contractors' compliance with prevailing wage requirements.

² In September 1991, the City's Management Analysis Team issued a report entitled *A Program Review of the Office of Affirmative Action and Contract Compliance* which underscored the City Administration's emphasis on minority and women in business enterprise outreach.

CONCLUSION

Our review of the DPW's management of unit-price and T&M contracts revealed the following:

- The DPW needs additional written policies regarding what its inspectors are expected to do or what responsibilities inspectors, project managers, and division chiefs are assuming when they sign-off on different documents;
- The DPW lacked adequate procedures regarding how inspectors should conduct inspections, prepare inspection reports, or authorize payments to contractors;
- The DPW lacked standardized forms for inspectors' reports;
- The DPW approved some payments to contractors without adequate supporting documentation;
- Inadequate separation of duties existed in that DPW employees who verified contractor construction work also approved contractor billings; and
- The Office of Affirmative Action and Contract Compliance's role in monitoring prevailing wage requirements is organizationally inefficient.

As a result, the DPW relies on contractors to submit accurate billings, which, in turn, exposes the City to the risk of paying for work not actually performed. By developing additional written policies, procedures, and forms and by requiring additional documentation and separation of duties over the contractor payment process, the DPW can have added assurance that payments to contractors for unit-price contracts and T&M contracts are correct.

RECOMMENDATIONS

We recommend that the Department of Public Works:

Recommendation #1:

Develop additional written policies and procedures to guide the project inspectors, project managers, and division chiefs as to their authority, responsibility, and accountability in monitoring payments for unit-price and time and material contracts. (Priority 3)

Recommendation #2:

Develop and implement department-wide written procedures specifying that:

- The inspectors should demonstrate their accountability in the field by recording measurements of quantities installed;
- The inspectors should submit written support for actual measurement of the work performed in accordance with contract specifications; and
- The divisions should file the inspectors' measurements in the project files. (Priority 3)

Recommendation #3:

Develop written procedures to require that the divisions document contract payments with the inspectors' certification of the measurement of actual quantities installed rather than with the contractors' billings. (Priority 3)

Recommendation #4:

Develop standardized forms to assist the inspectors in summarizing the actual measurements. (Priority 3)

Recommendation #5:

Establish specific guidelines that inspectors, project managers, and division chiefs are to use when they authorize and approve payments. These guidelines should address the type and format of documentation for each type of contract to ensure adherence to contract specifications. Furthermore, these guidelines should require that the inspectors' documentation of the contractors' work does not require additional explanation or interpretation to support payments. (Priority 3)

Recommendation #6:

Develop and implement written policies and procedures for all its divisions to assign responsibilities such that the same person or persons do not inspect the work that contractors perform and review and approve contract payments. (Priority 3)

Further, we recommend that the City Manager:

Recommendation #7:

Transfer the function for monitoring and enforcing prevailing wage requirements for the Department of Public Works' capital projects from the Office of Affirmative Action and Contract Compliance to the Department of Public Works. (Priority 3)

Further, we recommend that the Office of Affirmative Action and Contract Compliance or the Department of Public Works:

Recommendation #8:

Develop and use a log to monitor and document contractors' compliance with prevailing wage requirements. (Priority 3)